

a policy, in regard to tuberculosis, which would exert a power of prevention sufficient to control the existence and development of this disease, as fully as of smallpox or any other of the contagia.

### THE JUSTO-MAJOR PELVIS AS A FACTOR IN THE CAUSATION OF PERINEAL INJURIES.

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It is, of course, a self-evident fact that among patients with justo-major pelvis the obstruction offered to the descent of the fetal head is inversely proportionate to the size of the bony ring through which it has to pass, and that lacerations of the maternal soft parts are apt to occur as a result of precipitate labor or of malpositions of the presenting pole. Nevertheless, it is customary with many practitioners to give a favorable prognosis in such cases, and the patient or her husband is assured that the labor is bound to be easy because the pelvis is usually large and roomy. Such a prognosis is seldom verified in the lying-in chamber, as almost any obstetrician's case-book will show.

Posterior positions of the occiput, face, brow and compound presentations, prolapse of the cord and similar abnormalities all fall to the share of the "large and roomy pelvis," and set at naught the encouraging prognosis given weeks before.

Granting, however, a normal position of the vertex (occiput anterior) the outcome is seldom much better, and it is this class of cases to which particular attention is called. In such the first stage is apt to be tedious, the head does not engage readily, flexion is seldom complete and often rotation is improperly accomplished; the second stage is no better than the first, while, to make a bad matter worse, the maternal soft parts are almost invariably badly lacerated when the head passes through the vulva.

Notwithstanding the fact that with an anesthetic and careful management of the head its passage through the vulva can be controlled exactly, it is difficult to prevent this accident. The most rational explanation thereof seems to be that owing to the abnormally increased caliber of the justo-major pelvis the head does not "mold," and when it is delivered it distends the maternal soft parts to an excessive degree. It has, in fact, all the characteristics of a head in a breech delivery. Of course, if the infant is small the perineum may be saved, but women with justo-major pelvis do not as a rule bear small children.

The following brief outline of a case will serve to illustrate this type of labor:

M. T., American, twenty-two years of age, primipara, one of twenty-four children. The patient is a woman of fair height, proportionately well built, strong and healthy. Her external pelvic measurements are:

	Cm.	Average.
External Conjugate .....	21.5	(20½)
Ant. Sup. Spines .....	31.	(26)
Post. Sup. Spines .....	10.	(9½)
Iliac Crests .....	31.	(29)
Intertrochanteric .....	33.	(31)

The sacral promontory is well out of reach.

Six days before the birth of her child labor pains began and lasted for about twelve hours. Abdominal examination showed the fetus to be lying in the first position (L. O. A.). By vaginal examination the head was found to be almost resting on the pelvic floor, with the os uteri directed backward toward the sacrum and dilated to a diameter of about 3 cm. The membranes were intact; fetal heart 140. When her pains stopped she was allowed to go on from day to day under the care of a competent nurse, who was instructed to report at once the onset of any untoward symptoms. At the end of six days her pains returned and she was delivered naturally in seven hours. During the latter part of the second stage chloroform was given in sufficient quantity to prevent too rapid expulsion of the head, and every effort was made to save the perineum, which in spite of the utmost care was torn nearly to the sphincter. The child weighed seven and one-quarter pounds and its head was nearly globular, showing no signs of any molding or compression whatsoever. The lacerated tissues were repaired at once.

There is apparently no help for these cases, unless it be episiotomy judiciously performed, a procedure which the writer mentions only to condemn. Beyond this the physician can only bend every effort toward saving the soft parts with well-timed anesthesia and proper manipulation. For the rest, he should give a guarded prognosis and stand ready to perform an immediate and complete perineorrhaphy should circumstances require it.

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### REPORT OF BACTERIOLOGICAL INVESTIGATIONS UPON YELLOW FEVER.<sup>1</sup>

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*Preface.*—A report upon investigations carried out in Santiago de Cuba in the summer of 1898 was rendered before the work referred to in the present writing was begun. Frequent reference is made to it as "Report, December, 1898."

The bacillus icteroides, claimed by Dr. G. Sanarelli to be the causative agent of yellow fever, received particular attention, and having unexpectedly found it in three instances which certainly were not yellow fever cases, we can the more regret that the amount of work, which was excessive for one single investigator, did not

<sup>1</sup> This report embraces the research work undertaken in the City of Havana by order of the Surgeon General of the United States Army. It was begun early in December, 1898, and suspended in November, 1899, including a period of six weeks spent at Santiago de Cuba during the last epidemic.

allow the planting of material from many other than undisputed cases of yellow fever cadavers.

Hog-cholera, under the name of *pintadilla*, is a disease which prevails in this island to an enormous extent. Its pathogenic organism must be widely disseminated, and I do not doubt that careful cultures from the organs of cases of typhoid, chronic dysentery and the obscure fevers which are endemically met here, would reveal the bacillus *icteroides* as one of the many secondary invaders in the last septicemic processes.

*Introduction.*—In the summer of 1897 there appeared before the medical world from the pen of the renowned bacteriologist Giuseppe Sanarelli, a "memoire" upon studies he had made in Montevideo that enabled him to isolate a bacillus which in his opinion was the specific pathogenic organism of yellow fever. The discovery being announced by such a savant and through the columns of the *Annals of the Pasteur Institute of Paris*, it caused profound sensation: the work was published in several languages and in a comparatively short period the scientific world tacitly accepted the claims of Sanarelli and patiently awaited the preparation of the prophylactic serum, which was announced as already undergoing manufacture.

Cultures of Sanarelli's bacillus *icteroides* were secured in various laboratories and experimental work begun for the purpose of verifying his assertions. Unfortunately, indeed, for science and humanity, the results obtained have been most unsatisfactory; they lack that uniformity which is so essential and constant in all truly scientific facts. Even in the hands of Sanarelli's staunchest supporters this organism has behaved differently from the way described by the discoverer (DeLacerda and Ramos, *Archiv. de Med. Experimentale*, May, 1899); the frequency with which it has been found in the yellow fever cadavers varies with different investigators.

At the time of the epidemic which overran the littoral of Mississippi and Louisiana in the fall of 1897 much research was undertaken with the results herein briefly summarized. Dr. O. L. Pothier in his report of work performed at the Isolation Hospital, New Orleans, La. (*Jour. Am. Med. Assoc.*, April 16, 1898, p. 884-888) claims to have found Sanarelli's bacillus in only three out of fifty-one yellow fever autopsies; yet such result leads him to conclude that this organism is the "special cause of yellow fever." But that is not all, it happens that he did not isolate bacillus *icteroides*, for the organism which he describes required from 3.5 c.c. to 5 c.c. of a 24-hour bouillon culture to kill a rabbit; and a dog injected with 5 c.c. of a 24-hour bouillon culture, intravenously, survived even after a subsequent injection of 10 c.c., while the bacillus claimed by Sanarelli as his discovery proves fatal to rabbits in doses of 1 c.c. or 1.5 c.c., and to dogs from 3 c.c. to 5 c.c.

Drs. Wasdin and Geddings of the Marine Hospital Service, in a preliminary and separate

report of the work performed during the same epidemic (Public Health Reports, Washington, D. C., Nov., 1898, vol. xiii., No. 45), give what at first glance would appear as more satisfactory results. They claim to have found the bacillus *icteroides* in thirteen out of sixteen cultures made from yellow fever cadavers (the number not stated) and declare that their results "indicate that the bacillus *icteroides* of Sanarelli is the specific agent in the causation of yellow fever." (Geddings.)

In July of the current year we were presented with a complete and final report from these gentlemen of their original investigations upon the "Cause of Yellow Fever," in which, with evidently genuine candor, it is claimed that "in the blood of yellow fever cases extracted during life bacillus *icteroides* has been found in thirteen of the fourteen cases, with one negative, a per cent. of 92.85." (Report on Cause of Yellow Fever, p. 25. Also MEDICAL NEWS, Aug. 26, 1899, p. 266.)

To the average reader this statement would not seem at all remarkable if it were not for the fact that the result was reached, not through skillful and painstaking technic, but the reverse. All that Drs. Wasdin and Geddings had to do was to prick the lobe of the ear, collect the blood therefrom in glass bulbs, plant in bouillon and after a short period (not stated) plate from these cultures; and lo! bacillus *icteroides* occurred in every case but one. The degree of contamination which takes place by such procedure can easily be appreciated by the merest tyro in bacteriology. How Drs. Wasdin and Geddings can place any reliance upon results thus obtained is something that we cannot explain, knowing as we do their extensive scientific attainments.

In the same report we find this statement: "In this negative case Dr. Meacham obtained bacillus *icteroides* post-mortem." The writer is in a position to correct this mistake having received from Major Meacham a culture of the organism which he believed to be bacillus *icteroides* and which he had isolated from the case of Manuel Corujo (No. 9 in the Wasdin-Geddings Report) and not from Pedro Quintela (No. 14 in the Report) as stated by Wasdin and Geddings. On page 25 of their report, Drs. Wasdin and Geddings say, "In thirteen instances we isolated bacillus *icteroides* in pure culture." This statement is misleading, to say the least. Once the organism is isolated it must necessarily be in pure culture, or else it will not be isolated. If the remark quoted is intended to convey the idea that bacillus *icteroides* occurred in pure culture, then the statement is at fault, indeed, for in the same report we read that in Case No. 1, it was associated "with bacillus proteus vulgaris and bacillus coli?," in Case No. 5, with "bacillus coli;" in Case No. 7, they obtained at the same time colonies "also of two other organisms, one a colon;" in Case No. 10 it

<sup>2</sup>The bacillus coli (Escherich) Mig. is used throughout this report for the bacterium coli commune of Escherich.—Migula, p. 734.

occurred "together with a variety of bacillus coli;" in Case No. 22, the blood gave "mixed cultures of bacillus icteroides and bacillus coli." When associated with other organisms it could not have been present in pure cultures.

The fifth "conclusion" arrived at by the Commission (Report on the Cause of Yellow Fever) is to the effect that "cases do occur in which the bacillus icteroides cannot be found in the blood or organs in which it might be deposited." Yet, the Commission was so fortunate that in the fourteen cases examined here (Havana) it found the bacillus icteroides in the blood or in the organs where it had been deposited therefrom. Whence was the above quoted conclusion drawn? From the failure of others to find it?

The writer does not propose to make a detailed criticism here of the "Report on the Cause of Yellow Fever," but as his results in spite of apparently more careful methods than those employed by Drs. Wasdin and Geddings have been so very much unlike the achievements of these gentlemen, he thinks it not inopportune to call attention to the assertions and contradictory statements quoted above.

The fact that bacillus icteroides is often agglutinated and its motility arrested by the normal serum of the horse, dog, rabbit and other animals as well as by the serum of many persons who never had yellow fever, which fact has been ascertained by Novy,<sup>1</sup> Wasdin and Geddings,<sup>2</sup> and by the writer, certainly argues very strongly against the specificity of this organism in yellow fever. The fact that it promptly agglutinates by the action of hog-cholera serum in very high dilution again speaks most eloquently against the imputed relation it is said to bear upon the causation of yellow fever; Drs. Reed and Carroll have clearly established a close relationship between bacillus icteroides and bacillus cholera suis.<sup>3</sup> Finally, the incontrovertible fact that no protection to infection by bacillus icteroides is afforded by the serum of real yellow fever convalescents seems to very pointedly indicate that the relations between this organism and the disease in question must be of a most indirect or evanescent character.

In following the course of his bacteriologic investigations, the writer was compelled to abandon the digestive and respiratory tracts, which, upon planting therefrom, invariably produced such luxuriant growths as to very materially obstruct the process of isolation and classification; cultures were made principally from the blood during life, the heart blood, liver, spleen, kidney, bile and urine, the methods employed being described in the text. In the report handed to you in December, 1898, we said: "The work I have the pleasure to record here is far from ended," etc. Allow me to add to-day that the work here recorded is still "far from ended," moreover, that it will never be, until every investigator understands that his duty is not to join the ranks

that will promote personal aggrandizement, that he must not undertake research with preconceived conclusions, but that his labor must ever lie in the narrow path of unalloyed scientific truth. The writer must confess that the cause of yellow fever has escaped him; but the series of disappointments to which this research has subjected him are certainly amply repaid by the promising results derived from his attempts at serum-therapy.

*Conclusions.*—1. The specific pathogenic micro-organism of yellow fever is as yet an unknown entity in spite of the work reported by various observers; apparently, new methods of cultivation must be initiated or new culture media devised in future research.

2. The bacillus icteroides of Sanarelli, lately (1897) asserted to be the causative agent of yellow fever, is no more concerned in the production of this disease than the common colon bacilli which are constantly found in the blood and viscera of individuals suffering or dead from yellow fever.

3. When approved bacteriological methods are employed, the bacillus of Sanarelli does not, as a rule, appear in cultures from the blood of yellow fever patients.

4. Bacillus icteroides may be and has been found present in the tissues of cadavers dead from other diseases, neither allied nor similar to yellow fever.

5. The bacillus of Sanarelli, when subjected to agglutination tests, is not affected by the serum of yellow fever patients or convalescents.

6. The serum of convalescent yellow fever cases affords absolutely no protection against infection by the bacillus of Sanarelli.

7. None of the organisms thus far isolated from yellow fever cases can be considered as the pathogenic agent of the disease.

8. Experimental evidence has demonstrated that the serum of individuals convalescing from yellow fever, or who lately suffered an attack of this disease, will very materially and favorably affect those actually under the influence of the infection if injected under the skin, on or before the fourth day after the invasion; but that it requires further study to determine the protective power of different sera and the dosage.

9. From the experimental evidence above referred to, we are led to believe that the subcutaneous injection of convalescent's serum will convey immunity to individuals whom we to-day consider as susceptible to the disease.

*Material for Research.*—Material for research was obtained from cases of yellow fever during life at various stages of the disease; blood was drawn by pricking the ear-lobe for the purposes of planting and testing its clumping power, and from a vein at the elbow-joint; tissues and blood from various organs at autopsies were also obtained, some were planted, others were used in attempts at infecting animals. Later in our investigations we drew blood from convalescent yellow fever patients; serum was thus obtained

<sup>1</sup> MEDICAL NEWS, September 10, 1898.

<sup>2</sup> Report on Cause of Yellow Fever, p. 19, 24, and 78-79.

<sup>3</sup> MEDICAL NEWS, September 9, 1899.



with which to test its curative properties upon yellow fever cases and its protective power upon animals inoculated with some of the organisms derived from our cultures. A large number of cultures were made at the City Morgue from cases of sudden death, and some from necropsies other than of yellow fever cases.

*Ear-Tip Blood.*—The method of obtaining blood from the ear-tip for bacteriological research is one that is very generally and properly condemned; in spite of this fact, and the knowledge that the process is faulty and unreliable, we

hour; after an interval of from six to eight hours this was plated. In some few instances we plated directly from the blood. From reading Drs. Wasdin and Geddings' "Report on the Cause of Yellow Fever," the writer is convinced that he washed off bacillus *icteroides* from the ear-lobe of every one of the following cases in which the "results" appear as copied directly from our notes. (See table I.)

From Nos. 4 and 20 we obtained a micro-organism very much like bacillus *icteroides*; its effect upon various culture media was identical

TABLE I.

No.	Name.	Age.	Date.	Day of illness.	Result.
1	Th. B. Doane.....	52 yrs.	Jan. 9	4th.	Two non-pathogenic bacilli.
2	Arth. Atwood.....	23 "	Feb. 11	4th.	Not yellow fever.
3	Pat Smith.....	23 "	" 13	9th.	Not yellow fever; colon bacillus tetrad.
4	XX. Bradshaw.....	" "	" 26	10th.	Not yellow fever; small bacillus.
5	Man. Corujo.....	20 yrs.	Mar. 22	8th.	Tetrads; chromogenic etc.
6	Adres Sauer.....	20 "	April 6	6th.	Not yellow fever; contaminated.
7	Pedro Quintela.....	40 "	" 22	6th.	Colonies of two liquefying bacilli; microcci, etc.
8	".....	" "	" 24	8th.	A colon bacillus; a chromogenic coccus; mould.
9	Kauna Sessin.....	" "	" 21	4th.	Micrococ. tetragenous; moulds.
10	P. Rodriguez.....	36 yrs.	May 15	5th.	One non-motile bac.; staphylococci.
11	Higinio Guerra.....	14 "	June 4	2d.	Not yellow fever; contaminated.
12	A. J. Bathon.....	27 "	" 8	6th.	Not yellow fever; non-motile bac.
13	Rob. Stewart.....	33 "	" 12	5th.	All cultures contaminated by moulds.
14	".....	" "	" 16	9th.	A staphylococ.; two non-motile bacilli not pathogenic.
15	Wm. Kehrer.....	27 yrs. (?)	" 14	4th.	A tetracoccus and a long saprophytic bacillus.
16	Geo. Woods.....	22 "	July 21	6th.	One mould; two cocci; one chromogenic bacillus.
17	J. G. Thatcher.....	38 "	" 22	12th.	Mould contamination.
18	Mike Deveny.....	30 "	" 22	4th.	Staphylococ.; red colony.
19	Lant Sears.....	35 "	" 22	5th.	A non-motile bac.; mould.
20	Wm. Demuth.....	24 "	" 21	3d.	Tetrad; mould.
21	Wm. Shew.....	25 "	" 18	9th.	Two liquefying cocci.
22	W. J. Mooney.....	37 "	" 31	4th.	Staphylococci; a colon bacillus; mould.
23	J. A. Hays.....	20 "	" 31	4th.	Staphylococcus aureus.
24	Luis Colome.....	27 "	" 31	7th.	Tetracoccus; a chromogenic bacillus.
25	".....	" "	Aug. 3	10th.	Colon bac.; liquefying cocci.
26	J. J. Dougherty.....	29 yrs.	" 15	7th.	A non-motile bac.; mould.
27	B. Fowler.....	31 "	" 15	8th.	Chromogenic bacteria.
28	A. Weidner.....	33 "	" 15	5th.	Chromogenic bacteria.
29	Tim Healy.....	37 "	" 15	5th.	Staphylococ.; a non-motile bac.
30	S. Scanlan.....	" "	" 18	2d.	Large micrococci; mould.
31	".....	" "	" 21	5th.	A chromogenic organism.
32	H. R. Clay.....	27 yrs.	" 23	3d.	A liquefying coccus; a non-motile bacillus.
33	Rich. Graves.....	31 "	" 28	4th.	A colon bac.; staphylococci.
34	Ed. Vragel.....	19 "	" 27	4th.	Chromogenic bacteria.
35	".....	" "	" 29	6th.	Tetracoccus; a red colony.
36	Jess. Hilton.....	22 yrs.	Sept. 6	4th.	A long bacillus and two chromogenic organisms.
37	J. Thorsby.....	24 "	" 4	5th.	Mould contamination.
38	".....	" "	" 6	7th.	Micrococci; a colon bacillus.
39	Chas. Mitchell.....	30 yrs.	" 8	3d.	A liquefying coccus; mould.
40	".....	" "	" 8	5th.	A colon bac.; staphylococci.
41	Dan Coleman.....	53 yrs.	" 8	6th.	Tetrad; staphylococci; mould.
42	Chas. Rodgers.....	24 "	" 8	5th.	Much contaminated.
43	S. Fichman.....	29 "	" 14	4th.	Staphylococcus aureus.
44	".....	" "	" 16	6th.	A non-motile bac.; micrococci.
45	H. Sutherland.....	21 yrs.	Oct. 10	4th.	Badly contaminated.
46	".....	" "	" 12	6th.	Micrococci; a colon bac.

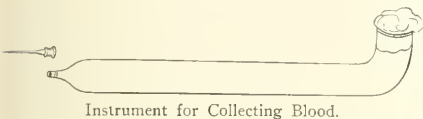
were induced to persevere upon its use by the rumor, lately confirmed, that Drs. Wasdin and Geddings, then engaged in the same work as the writer, were securing excellent results from it, isolating the bacillus *icteroides* in every case in which the blood was thus procured. Our method was to wash the lobe of the ear with alcohol and sterile absorbent cotton, pass the point of a lancet through the flame of an alcohol lamp, prick the ear with it, receive the issuing blood on the end of a sterile capillary glass tube, immediately sealing it at the flame; the two or three drops thus obtained were planted in bouillon within a half

with that produced by this bacillus, but it gave large quantities of gas with saccharose and glucose bouillon and its pathogenic action was less intense than that of bacillus *icteroides*. Aside from these two cases, there was no one organism obtained from any of the others that required more than a cursory examination to determine its extraneous origin and none was sufficiently constant to deserve even the suspicion that it was at all related to the disease. From this we conclude that blood taken from the ear-tip, in spite of cleansing processes such as may be carried out at the patient's bed-side, is unfit for anything

more than microscopical examination or agglutination tests, that planting from such blood will in the majority of instances be contaminated, and that at all events the results thus obtained will always be open to doubt and adverse criticism.

*Venous Blood.*—The conviction of the worthlessness of ear-tip blood as material for research induced us to devise some means whereby to obtain blood during life in a manner that would preclude all probability of contamination. With this object in view we had made a number of glass tubes (Fig. 1) coming to a point with a

Fig. 1.



Instrument for Collecting Blood.

ground tip to which the platino-iridium needle is attached. The curved end is for the purpose of preventing the blood as it enters the horizontal tube from coming in contact with the cotton plug. The glass tube with its end cotton-plugged is sterilized, wrapped in gauze or filter paper. At the moment of using the needle is held by the point and the other end subjected to the flame of an alcohol lamp; the glass tube is unwrapped and the needle is fixed to the ground tip. The whole needle is then held in the flame until it becomes red hot, when we shall have a perfectly sterile tube from the point of the needle to the cotton plug in the curved glass tube. The bend of the elbow having been made surgically aseptic by the use of soap and water, bichloride solution and ether, pressure is made above while the needle is introduced into any of the superficial veins that will consequently swell up; once into the vein, the blood will readily flow through the needle into the glass tube and from one to six cubic centimeters may be thus collected.

The culture media may be carried to the bedside, or the blood safely taken into the laboratory and planted; one or two drops are allowed to fall into each tube. This method of securing aseptic blood has given uniform results in our hands. The pain inflicted is not greater than that produced by the ear-tip process and no greater care of the puncture is required, while the safeguards by which it is surrounded will necessarily inspire confidence in the results derived from its employment.

Out of a total of 281 agar tubes there were but 8 contaminated; of 25 milk plantings only one contamination, and of 49 bouillon tubes, 2 became contaminated. In not a single instance did the bacillus *icteroides* make its appearance. The organisms which developed in our culture media were thoroughly studied, with the following results: In case No. 4, one agar tube contaminated by *staphylococcus pyogenes albus*. In case No. 7, three agar tubes contaminated by a bacillus which liquefies gelatine; the same organism

in all the tubes; 3 c.c. of a bouillon culture failed to kill a guinea-pig weighing 325 grams. In case No. 17, one milk and two agar tubes contaminated by a large non-liquefying micrococcus which produces endospores; subcutaneous injection developed abscesses, localized. In case No. 21, two bouillon and one agar tubes contaminated by mould. In case No. 27, one agar tube contaminated by mould, and a bacillus which forms filaments of unusual length, coagulates milk and renders a decided acid reaction to all culture media. None of the organisms obtained can be accused of being the causative agent of yellow fever. The result is disappointing, indeed, but such has been this investigation from the beginning; the only satisfaction that can be derived from it lies in the consciousness of its truth and a confidence in the methods employed.

*Necropsies upon Yellow Fever Cadavers.*—We believe that the history of each case autopsied, if detailed here, would make this report un-

TABLE II.

No.	Name.	Day of Illness.	Amount Drawn.	Bouillon.	Milk.	Agar.
1	Manuel Corujo.	8th.	3 c.c.	.....	.....	14 tubes.
2	Geo. Woods....	7th.	5 c.c.	.....	.....	6 "
3	Mike Deveny....	4th.	5 c.c.	.....	.....	12 "
4	Arth. Hayes....	6th.	3 c.c.	.....	.....	10 "
5	Robt. Cole....	7th.	5 c.c.	5 tubes.	.....	12 "
6	T. H. Buchanan.	3d.	4 c.c.	.....	.....	20 "
7	G. P. Thomas ..	9th.	3 c.c.	8 tubes.	.....	11 "
8	Land Sears....	5th.	5 c.c.	.....	.....	14 "
9	Wm. Demuth....	3d.	3 c.c.	.....	.....	8 "
10	B. Dadd....	4th.	5 c.c.	.....	.....	9 "
11	Wm. Shew....	5th.	3 c.c.	.....	.....	21 "
12	Wm. Mooney....	3d.	3 c.c.	.....	.....	12 "
13	J. A. Hays....	5th.	5 c.c.	.....	.....	16 "
14	Luis Colome....	4th.	7 c.c.	.....	.....	8 "
15	J. G. Thatcher.	5th.	5 c.c.	.....	.....	10 "
16	J. J. Dougherty.	7th.	2 c.c.	.....	.....	8 "
17	B. Fowler....	5th.	4 c.c.	.....	4 tubes.	12 "
18	A. Weidner....	3d.	3 c.c.	3 tubes.	.....	6 "
19	Tim Healy....	5th.	2 c.c.	.....	2 tubes.	4 "
20	S. Scanlan....	6th.	6 c.c.	4 tubes.	4 "	9 "
21	H. R. Clay....	9th.	5 c.c.	6 "	.....	.....
22	Ch. Allison....	8th.	2 c.c.	4 "	.....	.....
23	Rich. Graves....	7th.	3 c.c.	2 "	.....	7 "
24	Ed. Vragel....	8th.	2 c.c.	.....	.....	4 "
25	J. Thorshy....	9th.	3 c.c.	.....	3 tubes.	6 "
26	Ch. Mitchell....	7th.	2 c.c.	.....	.....	8 "
27	Max Thompson.	5th.	3 c.c.	3 tubes.	4 tubes.	4 "
28	Ch. Rodgers....	8th.	5 c.c.	3 "	4 "	4 "
29	S. Fichman....	3d.	4 c.c.	3 "	.....	8 "
30	E. Bubeck....	3d.	4 c.c.	6 "	.....	6 "
31	Dan. Coleman ..	3d.	3 c.c.	2 "	4 tubes.	4 "

necessarily extended. The facts placed before each name in the following list will enable any one to verify them, if so inclined, by referring to the records of the Yellow Fever Hospital at Santiago de Cuba and Las Animas Hospital at Havana. Sections of tissues from all these cases were sent, from time to time, to the Curator of the Army Medical Museum, Washington, for study at the Pathological Laboratory of that institution. For the sake of brevity the notes made upon the pathological lesions encountered are also omitted; suffice it to say that the degree of

fatty degeneration of the liver was intense and "black vomit" was present in the stomach of all of them. Other lesions, also common to all, varied in the degree of their intensity; such were the heart infiltration, renal affection, engorged vessels, internal hemorrhages, icteric skin, etc. The disease in all these cases followed a typical course, as evidenced by its onset, development and the pathological lesions it produced (See table III.)

TABLE III.

No.	Name.	Rank and Regiment.	Age.	Admitted.	Died.	Time after Death of Autopsy.
1	F. L. Johnson	Priv. 2, 5th Inf.	27 yrs.	July 12	July 17	3 hrs.
2	Sam Griffith	Civilian.	25 "	" 13	" 14	3 "
3	Wm. Stewart	Civilian.	24 "	" 13	" 14	12 "
4	Wm. Turney	Private	34 "	" 12	" 15	2 "
5	Geo. Olsen	1st Cps	35 "	" 13	" 19	1 "
6	Arthur Hayes	Sgt. Com. Dept.	44 "	" 13	" 20	5 "
7	Robt. H. Cole	Civilian.	30 "	" 15	" 23	3 "
8	John Mack	Civilian.	32 "	" 15	" 28	11 "
9	John Fulley	Civilian.	38 "	" 20	" 29	1 "
10	James M. Hays	Civilian.	20 "	" 30	Aug. 2	1 "
11	J. M. Mooney	Civilian.	37 "	" 29	" 3	8 "
12	D. V. Fernandez	Civilian.	30 "	Aug. 17	" 18	6 "
13	Reed Lucas	Priv. K, 2d Art'y	19 "	" 22	" 26	2 "
14	Cliff Calhoun	Priv. B, 2d Art'y	33 "	" 24	" 28	8 "
15	Clyde W. Sheets	Priv. I, 2d Art'y	26 "	" 30	Sept. 3	9 "
16	N. Goodwin	Sgt. I, 2d Art'y	25 "	Sep. 2	" 7	3 "
17	David Peebles	Civilian.	28 "	" 10	" 13	2 "
18	Ramon Borbolla	Civilian.	21 "	" 13	" 18	10 "
19	Ramon Olsen	Civilian.	45 "	Oct. 7	Oct. 7	3 "
20	John Corey	Civilian.	25 "	" 8	" 10	3 "
21	Th. C. Smith	Civilian.	21 "	" 23	" 27	12 "
22	B. F. Markwood	Civilian.	24 "	" 24	" 28	7 "
23	Henry M. Land	Civilian.	24 "	Nov. 3	Nov. 12	12 "

The first eleven cases occurred at Santiago de Cuba, the twelve that followed at Havana.

The conditions under which the autopsies were performed at Santiago de Cuba compelled us to refrain from attempting any cultures by the side of the cadaver and made it necessary to collect the material, in capillary glass tubes, and then take it into the laboratory tent, there to plant it in the culture media. For this purpose we made use of double-bulbed glass tubes (Fig. 2). After sterilizing the surface of the organ by means of a heated blade, the end of the capillary tube was broken off, passed through the flame, the bulb, *A*, heated and then the point introduced into the organ; by working the glass tube back and forth, considerable tissue and blood is made to enter into the bulb *B*, promoted by the cooling of the air in bulb *A*. When a sufficient amount is obtained, the end of the tube is sealed at the flame and the material is ready for planting. By having the double bulb, the material does not come in contact with the heated glass but remains at the first expansion in the tube.

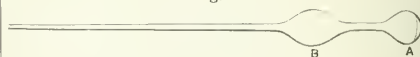
*Bacillus coli*.—This organism, or rather some

member of this group, was present in the cultures from every one of the autopsies above recorded. It was constantly found in the liver; in 8 cases (Nos. 1, 3, 4, 7, 9, 14, 21, 23) it occurred in cultures from the heart-blood; it was recognized in cultures from the kidney of 6 cases (Nos. 1, 2, 4, 5, 8, 20), the spleen of 4 cases (Nos. 4, 7, 11, 16), and the urine of three (Nos. 2, 9, 10).

Both motile and non-motile forms were isolated. The colon bacillus, like the majority of the organisms here described, must be one of the many invaders of the circulation at the last moments of the individual's life; we are led to this belief, not only because of the frequency of its presence, but more so from the fact that it was not found in the blood of patients during life.

*Bacillus X (Sternberg)*.—Associated with the bacillus coli in a large number of cultures, its presence being recognized in some instances only after passing through guinea-pigs, was the bacillus *X* of Sternberg. This organism presented peculiar motility in some cultures while in others it occurred as a non-motile bacillus. It was classified principally from its pathogenic action on guinea-pigs which, when inoculated with pure cultures of bacillus coli, usually recovered; when these cultures contained bacillus *X*, a fatal result was the rule. It becomes deprived of its motility with great readiness, sometimes within a period of a few days. Passing

Fig. 2.



Double bulb for autopsy collections.

through susceptible animals will not restore locomotion. It is somewhat larger than the common colon bacillus; it stains readily by the aniline colors; retains the stain by Gram's method; grows easily in the ordinary culture media; does not liquefy gelatine. It is pathogenic to guinea-pigs and rabbits in intraperitoneal injections of from 1 c.c. to 3 c.c. of 24-hour bouillon culture. It was obtained in eleven autopsies, as follows: In the liver of six (Nos. 2, 3, 8, 11, 14 and 16); in the spleen of three (Nos. 2, 5 and 9); in the kidney of one (No. 17); in the urine of three (Nos. 15, 17 and 21) and in the blood of No. 13.

Drs. Wasdin and Geddings claim to have isolated this organism from the stools, urine and blood of a case of yellow fever,<sup>1</sup> but they add "called by Sternberg *X*, and by Archinard *A* and *B*." The two organisms referred to are as unlike as bacillus *X* and bacillus icteroides, and no one before has ever claimed their identity.

*Bacillus pyocyaneus*.—This organism, whose description we shall but briefly outline here, was obtained in cultures made from autopsies Nos. 1, 8, 14, 19, 20, 21, and 23. It is a short, motile bacillus; it grows in bouillon, potato, agar and

<sup>1</sup> Report on Cause of Yellow Fever, p. 16.



gelatine, liquefying this last medium in two or three days after planting. It gives to agar and gelatine, sometimes to potato, a light fluorescent greenish tint. Some of the organisms here classified as bacillus pyocyaneus may have been bacillus fluorescens liquefaciens (Sternberg), as no animal inoculations were undertaken except in two instances (Nos. 19 and 21). The organism was pathogenic to guinea-pigs and rabbits in subcutaneous injections of 0.5 c.c. or 1 c.c. of a 24-hour bouillon culture.

*Bacillus icteroides* (Sanarelli).—The bacillus icteroides occurred in seven autopsies out of twenty-three (Nos. 5, 6, 10, 11, 15, 16 and 23) making an average of 30.43 per cent. Its frequency in the organs was as follows: In cultures from the liver and heart-blood of No. 5; from the liver and spleen of No. 6; from the liver and kidney of No. 10; from the kidney, blood and urine of No. 11; from the liver and pericardial fluid of No. 15; from the kidney of No. 16; from the liver and spleen of No. 23. Hence it will be seen that it was present in the liver of 5 cases, heart-blood of 2 cases, spleen of 2 cases, kidney of 3 cases and pericardial fluid of 1 case. We have been surprised at the comparative scarcity with which this organism has developed in our cultures, when, according to the report of the Marine Hospital Service Commission (Drs. Wasdin and Geddings), it was present at some time or other in the blood of all (14) cases of yellow fever that were examined, but one. Every one of our cultures was closely searched for evidences of this bacillus, and the methods we employed towards its discovery were those most highly approved of by bacteriologic technic. If we ever left a colony without thorough examination or classification, it was because we found it composed of micrococci or non-motile bacilli; while on the other hand much time was spent upon motile bacilli which at all resembled in their cultural characteristics the bacillus icteroides. That this organism is not to be found in yellow fever as frequently as Drs. Wasdin and Geddings would have us believe is shown by the evidence of Sanarelli's own supporters, Drs. De Lacerda and Ramos,<sup>1</sup> who vainly sought for it during last winter's epidemic in Rio de Janeiro. They say: "Mais il faut dire, avant cela, que l'un de nous (M. Ramos) a fait des tentatives répétées dans le but d'isoler du cadavre le bacille de Sanarelli, sans y réussir."

These gentlemen have found decided discrepancies between Sanarelli's description of the organism, and the way it has behaved in their hands; in the article referred to above, they say (p. 384): "Malgré toute notre bonne volonté, il faut bien dire, nous n'avons pas pu trouver cette forme, dite spécifique, des colonies, dans un nombre assez grand de cultures, soit en gelatine, soit en gélose." Sanarelli pretends to explain this by claiming unusual "pléomorphisme" for bacillus icteroides.

The organism which we isolated from these autopsies is a small bacillus that stains readily with the ordinary stains and gives up the color with Gram's method. It is motile, aerobic (facultative anaerobe), and grows in the usual culture media, producing gas in glucose bouillon. It is pathogenic to guinea-pigs in subcutaneous injections of from 0.3 c.c. to 1 c.c. and also to rabbits and dogs, the latter dying from an intravenous inoculation of 6 c.c. The lesions it produces are such as are found with many other organisms; now and then, in the liver of guinea-pigs, we have observed the focal necroses first described by Dr. Reed of the Army Medical Museum Laboratory, Washington, D. C. We have not engaged in experiments to ascertain its connection with the hog-cholera bacillus. That a close relation between them must exist is made evident by the researches of Reed and Carroll.<sup>2</sup> Bacillus icteroides was isolated by us in 33.33 per cent. of the cases examined at Santiago de Cuba in the summer of 1898.<sup>2</sup>

*Bacillus acidiformans*.—This was present in autopsies Nos. 12, 20 and 21; obtained in cultures from the livers of these cases. It is a non-motile, rather large bacillus; it quickly acidifies the culture media forming gas bubbles in gelatine stick cultures. It had a decided action upon litmus milk, a heavy growth on agar slants; its pathogenic power was not determined.

*Staphylococcus pyogenes aureus*.—This occurred in cultures from the liver of autopsy No. 3, but has not been met with in any other examination.

*Staphylococcus pyogenes albus*.—This was obtained in cultures from the liver of case No. 12. It has frequently occurred as a contamination from the surface of the body or from the air.

*Chromogenic bacteria* from air contamination were also found.

*Anaerobic cultures* were made exclusively from some of the Havana autopsies; particularly from cases Nos. 14, 16, 17, 21 and 22.

The method employed has generally been the substitution of the air in the culture tube and media by hydrogen gas, then sealing the test tube at the blow-pipe. In this manner several growths have been developed; nearly all of them were identified with like organisms in our aerobic cultures, while only two bacilli developed that may be said to have been strict anaerobes: one of them was undoubtedly the *bacillus cadaveris* of Sternberg. This was present in cultures from the livers of autopsies Nos. 14 and 21. The growth was obtained in plain-agar slants and stick cultures. The organism isolated was afterwards cultivated in glycerine agar (2 per cent). A subcutaneous injection proved fatal to three guinea-pigs. Two others injected with the same organism recovered.

*A Sporulating Bacillus*.—This was present in the liver of No. 21. The original growth was

<sup>1</sup>"Le Bacille Ictéroïde et sa Toxine," Arch. de Med. Exper. et d'Anat. Path., Vol. XI., No. 3, May, 1899.

<sup>2</sup>MEDICAL NEWS, September 9, 1899.

<sup>2</sup>Author's Report, December, 1898.

obtained in a plain-agar tube stick culture, treated as above outlined. It developed alongside of bacillus cadaveris, producing whiter and less granular growth. It is larger and more slender than bacillus cadaveris, and forms spores which resist the action of 80° C. for thirty minutes. It is non-motile and strictly anaerobic. It is apparently non-pathogenic, its subcutaneous injection of guinea-pigs produce edema and abscess with very foul odor.

#### *Autopsies upon Other Than Yellow-Fever Cadavers.*

As mentioned in the beginning of this report, the writer endeavored to obtain permission to perform autopsies upon cases dead from other diseases than yellow fever, but the amount of work which came upon us at the early part of the summer very materially prevented the possibility of research in other channels. As it is, numerous cultures were made at the city morgue from cases of sudden death. Some of the bodies were allowed to remain on the table for too long a period of time to be of any use as bacteriological material, but in most instances the autopsy was made a few hours after death. The number of organisms isolated is greater than we would care to even outline here and as the work was undertaken for the sole purpose of finding bacillus iteroides, if present, no time was wasted upon any single species that showed the slightest discrepancy with any of the well-known characteristics of this organism. It was present in one of them. Besides the sudden death cases, cultures were made from eight other autopsies; the bacillus iteroides of Sanarelli was found in two of them, making in all three cases in which there was not the barest possibility of yellow fever infection.

They were as follows:

*February 13, 1899.*—At the city morgue, the body of a white man about thirty years of age, had died as a result of stab wound of the abdomen. Upon opening the peritoneal cavity it was found to contain a large quantity of purulent serum, the intestines being matted together with plastic exudate. Cultures were made from the liver and spleen only, upon six agar slants. On the following day three tubes were discarded, the degree of contamination did not warrant the time that would be required in isolation and classification; from the other cultures, two from the liver and one from the spleen, three organisms were plainly isolated: (1) *Bacillus coli communis*, (2) bacillus iteroides, and (3) staphylococcus aureus. The patient was a native and had been perfectly well until two days before, when he was stabbed.

*February 15, 1899.*—Patrick Smith, private, Company B., 8th U. S. Infantry, died at 11 A. M. The autopsy was performed by the writer at 1:30 P. M., in the presence of Drs. Wasdin, Geddings and Menocal of the Marine Hospital Service, Majors Gorgas, Davis and Ducker of the

Army, Assistant Surgeon Truby, who treated the man during his illness, Dr. Porto, director of the city morgue, where the autopsy was made, and Drs. Cordova, Carvallo and Castro, the last two gentlemen being the coroners on duty at the time. Patrick Smith was admitted to the Regimental Hospital at La Punta on February 4th, complaining of having felt sick for about a week, which he attributed to malaria, having suffered from this disease in Santiago the previous summer; he was quite anemic, there was some albumin in the urine, the temperature kept around 103° F., the pulse was always high, above 100 beats per minute. During his illness he had liquid stools, yellow, and marked adynamia; no vomiting took place nor was there any epigastric tenderness except upon forcible pressure. We saw the case for the first time on the morning of the 10th, as it was suspected that he was suffering from yellow fever; on the 11th we took blood from the ear-tip and planted it with the results already mentioned above. (See ear-tip blood.) We again saw the patient on the 12th and every day afterwards until his death, eleven days after admission to the hospital. We never believed the man had yellow fever, although we admitted that the case was obscure until later, when we learned that there was a slight epidemic of typhoid fever in Company B.

We take special pains in describing this case, because in the "Report on the Cause of Yellow Fever" Drs. Wasdin and Geddings give this as a typical (1) yellow fever case of "serious type and prognosed death within forty-eight hours" (loc. cit., p. 14), which prognosis was realized five days afterwards.

The lesions encountered were as follows (taken from our notes): The body was emaciated, and its color that of the cadaver of anemic individuals; the gums were pale, the sclerotics had a slight yellowish tint. There were hypostatic congestions on the neck, trunk and extremities; on section, the tissues were found very dry. The liver was very much enlarged, of a purplish hue, with a hard, glistening, smooth surface, and absolutely no evidence of fatty degeneration, a congested hyperplastic liver such as is found in autopsies upon chronic malarial cases. The cut surfaces were smooth and bled freely. The spleen was the size of a man's head, hard, congested, of an ashy-blue color. If these two lesions alone had been met with, the case would have been declared a victim of the malarial parasite; they were typical, except for the great extent to which the organs were involved. The stomach was slightly dilated; the mesenteric vessels rather full; it contained absolutely nothing but undigested food (milk) and mucus; the mucous membrane was pale except at the posterior surface, where there was some hypostatic congestion; it was also edematous and easily torn in manipulation; there was no submucous extravasation nor any sign of any vascular disintegration. The duodenum contained the same liquid food; the mucous membrane was pale, except at



the dependent portion where there occurred hypostatic congestions. The small intestine was examined throughout its whole length, at its lower portion it contained semi-solid fecal matter of a pale-yellow color. At short and regular intervals, corresponding with the intestinal coils, there were areas of hypostatic congestion which were thought by some one present to have been submucous extravasations, but upon section were found to be as above stated, purely congestive areas which probably began to form long before the patient's death, he having been in an adynamic condition for several days previous to the fatal termination of his disease. The mucous membrane was puffy and particularly near the ileocecal valve; Peyer's patches, although visible, cannot be said to have been enlarged; there were a few swollen mesenteric glands in this region.

The colon contained the same pale-yellow feces, and aside from a friable eroded mucous membrane showed no other lesion of apparent importance. From the esophagus to the anus no evidence of the slightest free hemorrhage was encountered. The kidney was slightly enlarged and congested, the seat of a subacute interstitial nephritis. The capsule was not adherent. The pericardium contained a small amount of serous fluid. The heart contained much blood, the walls were rather soft, but there were no evidences of fatty degeneration. No engorgement of its vessels was present, the vasa vasorum at the base were not enlarged; the endocardium was normal; a weak heart and nothing else. The lungs were somewhat edematous and presented hypostatic congestion posteriorly. A diagnosis of anything else than yellow fever could have been made from the findings at this autopsy; none of the gentlemen present, except the representatives of the Marine Hospital Service, with the evidence placed before them, had any doubt in this regard; Dr. Wasdin insisted that the lesions of the intestines were extravasations and not hypostases; Dr. Geddings was doubtful; Dr. Menocal said nothing.

Our opinion was that the man had died of an enterosepsis of undetermined character, very materially aided by a chronic malarial infection, and that the bacteriological cultures would undoubtedly throw some light on the actual cause of death.

At the risk of lengthening this report to a tiresome extent, we beg to quote from the evidence of some of the gentlemen who saw the patient during his illness and at the post-mortem.

Lieut. A. E. Truby, Assistant Surgeon, U. S. Army, was in charge of the case at the Regimental Hospital; he writes us: "In my opinion he (Patrick Smith) did not have yellow fever. He had a marked amount of albumin in the urine, present from the beginning to the end of his sickness and in about the same proportion. He had been a sufferer from chronic malaria since the campaign in Santiago. During his last spell of sickness he had all the signs and symptoms of typhoid fever. Another case from the same

Company died on the hospital ship "Missouri;" the autopsy showed marked typhoid ulcers and evidences of chronic malaria. The symptoms in both cases were the same. In all cases of typhoid fever in men who have been in this hospital, who were still suffering from the chronic malaria contracted in Santiago, we have found albuminuria. Smith had a pulse rate above 100 per minute throughout, and a temperature ranging around 103° F."

Major W. C. Gorgas, Surgeon U. S. Army, writes: "I observed P. Smith, 8th Inf., for about a week before he died. During his life I considered the case suspicious with possibilities in favor of yellow fever. At the autopsy I was convinced that the case was not yellow fever. I saw nothing in any of the organs that resembled yellow fever. There have been quite a number of cases of typhoid fever from this Company, two of them presenting symptoms very much like Smith's. Seven of ten medical men present at the autopsy gave their opinion against yellow fever."

Major Orlando Ducker, Surgeon, U. S. V., writes: "I first saw the case, with Major J. G. Davis, on February 9th, 1899 . . . it was then the 8th day of the soldier's illness. Temperature 103.5° F.; pulse, 132; respirations, 29. My diagnosis was pernicious malaria with typhoid complications . . . I saw the case two or three days later; there had been no change; temperature 102.5° F.; pulse, 124; respirations, 28. There was increased tympanites, increased sensitiveness over the bowel, but not so over the duodenum. The yellow tinge of the skin not so deep. A few days thereafter, I was present when you made the autopsy. The skin was less yellow than during illness . . . I believe had the patient lived a few days longer, there would have been sloughing and perforation of the bowel. The liver was a typical malarial one, there was no yellowish or steel-colored hue. From the history of the case and from examination as well as from autopsy, I can make no other diagnosis than pernicious malaria with typhoid complications and I believe these two were the sole cause of death."

Dr. E. M. Porto, Director of the City Morgue, writes: "Neither from the color of the body, so characteristic in yellow-fever cadavers, nor from the pathological lesions found, could I suspect for a moment that we were dealing with a yellow-fever case; the predominating hyperplasia of liver and spleen indicated a malarial infection." (Translation.)

Dr. S. de Castro, one of the coroners on duty, writes: "I am inclined against the case being yellow fever; it lacked the icteric tint and the hemorrhages or blood infiltrations of stomach and small intestine. The spleen and liver indicated paludism." (Translation.)

Dr. Frederico Cordova also believes the lesions were mainly malarial; he writes: "The color of the skin was not of that distinct yellow which is found in yellow-fever cases, neither did the liver

by its dark color and firm consistency have any similarity with the changes regularly found in that disease; there was also total absence of the hemorrhagic extravasations so typical in yellow fever." (Translation.)

Microscopic examination of the blood made on February 11th, at the Laboratorio Histo-Bacteriologico revealed the presence of malarial parasites and pigmented leucocytes.

We found bacillus typhosus and bacillus icteroides in almost pure cultures from the spleen; bacillus typhosus in pure culture from the kidney; colon bacilli; bacillus icteroides and a non-motile bacillus from the blood of the bacillus only from the blood of the heart. With regard to the presence of bacillus icteroides and the influence it may have exerted in this case, we beg to refer to the "Report on the Cause of Yellow Fever;" it says: "At this visit (February 10th) blood was taken from the ear-tip (on the sixth day of the disease), and when plated gave us numerous colonies of bacillus icteroides" . . . (page 14). "On the 12th from the blood taken a serum test was made in the dilution of 1 to 20, with a bouillon culture of bacillus icteroides and there was not the slightest influence of either motion or agglutination in three hours. Nor could we get a reaction at any time. This organism we have used very extensively in further work on animals, the resulting necropsies always showing the most characteristic changes in the liver, stomach and intestines."

From the above paragraphs it will be seen that it is claimed that bacillus icteroides was present in large quantities in the blood of the patient on the sixth day, yet on the eighth day it fails to be influenced by the serum of this same individual, even after three hours (!) when normal serum would certainly tend to, at least temporarily, immobilize or agglutinate bacillus icteroides. This confirms us in our belief that bacillus icteroides, if present in the blood of Patrick Smith as early as claimed by Wasdin and Geddins, did not exert any influence upon the severer typhoid-malarial symbiosis from which he was suffering. Bacillus icteroides in this instance ran hand-in-hand with the colon bacillus and the other micro-organisms that were isolated.

July 14, 1899.—Benjamin Goodman, civilian, twenty-three (?) years of age, died at 1 P. M.; autopsy at 5 P. M. The man had been suffering from rheumatism for over a month; was treated for malaria up to one week before his death; lately he had dysentery and had been prostrated in his store in Santiago de Cuba, unable to attend to his business (saloon-keeper); he had not had medical attention for three days, when he was found in a dying condition in his room. The city being at the time strictly under quarantine, the body was taken to the Yellow Fever Hospital for the purpose of ascertaining the cause of death.

On autopsy, it presented the following, taken from our notes: "The body is that of a man about forty-five years of age, in rigor mortis,

very pale, there is much abdominal fat; hypostatic congestion on the dependent portions. There is no icterus. The mesentery also contains much adipose tissue. The liver is large, of a dark, mottled ashy-brown color, the surface very rough, cirrhotic, with areas of fatty degeneration; cut surfaces granular and moist; the liver of chronic alcoholism. The spleen is of normal size, congested. The stomach is very much dilated, to three times its normal size, the walls are very thick; it contains a large quantity of clear gastric juice and mucus; the mucous membrane is thickened, edematous; the peptic glands are inflamed and enlarged. The duodenum is congested, and contains a small amount of bile. The small intestine is generally inflamed, the seat of an acute enteritis. The colon contains liquid feces; the mucous membrane is swollen and eroded, particularly at the descending portion. Some mesenteric glands were enlarged. The kidney is the seat of a chronic parenchymatous nephritis; the capsule is adherent. The abdominal cavity contains a quantity of serous effusion. The pericardium is tough and contains a small amount of serum. The heart is very much hypertrophied, but soft and in diastole; it contains very little blood. The endocardium is roughened by vegetations; there are calcareous deposits in the auriculoventricular and aortic valves and retraction and insufficiency of the mitral and aortic. The aorta is in an atheromatous condition. The lungs are edematous, on section giving large quantity of serous fluid. The pleurae are smooth and apparently normal.

Cultures made from the liver of this case developed bacillus icteroides in company with bacillus coli, and a pathogenic variety which was accidentally sterilized and could not be studied further.

The three cases above described were not yellow-fever cases, and we offer them in refutation to the statement made that bacillus icteroides is not found except in yellow fever.

(To be continued.)

## CLINICAL MEMORANDUM.

### ATRESIA VAGINÆ; SOLID UTERUS; HEMATOMA OF LEFT OVARY.

By H. J. GARRIGUES, M.D.,  
OF NEW YORK;  
GYNECOLOGIST TO ST. MARK'S HOSPITAL.

M. B., American, twenty years of age. Has never menstruated. Every four weeks for the last four years she has had severe pain radiating from the back, around the abdomen to the hypogastric region, lasting a week. Epileptic convulsions, with complete loss of consciousness, foaming at the mouth, and biting the tongue, preceded and often followed the molimina. The patient's intelligence has suffered, as evinced by slowness in answering questions.

Vaginal examination showed a normal vulva